≋USGS

WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2002MN1B

Title: Characterization of Nitrifying Bacterial Populations in Wastewater Treatment Bioreactors

Project Type: Research

Focus Categories: Treatment, Waste Water, Surface Water

Keywords: Ammonia, eutrophication, nitrification, PCR, wastewater

Start Date: 03/01/2002

End Date: 02/28/2004

Federal Funds Requested: $13,290

Non-Federal Matching Funds Requested: $26,459

Congressional District: Fifth

Principal Investigator:
Timothy Michael LaPara
University of Minnesota

Abstract

Excessive nitrogen loading to the Mississippi River basin has been recently linked to the development of a large hypoxic zone in the northern Gulf of Mexico. As a result, there is renewed interest in achieving complete nitrogen removal from municipal and industrial wastewater. One of the most critical challenges that must be addressed before complete nitrogen removal can be consistently achieved is to reduce and eliminate upsets in the nitrification process. Nitrifying bacteria are well known to be susceptible to numerous factors such as temperature, pH, and toxic compounds. One of the problems with eliminating nitrification upsets is that there is a virtually complete lack of knowledge regarding the community dynamics of nitrifying bacteria. The research proposed herein would track both nitrifier community structure and total biomass at a municipal wastewater treatment facility for a period of one year. This research will identify the specific nitrifying bacteria that are associated with excellent nitrification efficiency, thereby leading towards the development of specific operational strategies to promote the growth of these nitrifying bacteria. In summary, this research will be an important step in reducing the total nitrogen loading to the Mississippi River basin and the northern Gulf of Mexico.